

WHAT IS CLAIMED AS NEW AND IS INTENDED TO BE SECURED
BY LETTERS PATENT IS:

1. A method of preparing a cement matrix or hydraulic binder comprising:
5 preparing an aqueous dispersion comprising a mineral filler and a dispersing agent, and
adding the aqueous dispersion to a cement or hydraulic binder,
wherein the dispersing agent comprises a copolymer prepared by the radical
copolymerization of at least one alkoxy-, aryloxy-, alkylaryloxy- or arylalkyloxy-
10 polyalkylene glycol ethylenic urethane monomer with at least one anionic monomer
and at least one non-ionic monomer.
2. The method according to Claim 1, wherein the urethane monomer is an
alkoxy-polyethylene glycol urethane.
- 15 3. The method according to Claim 1, wherein the copolymer further
comprises an alkoxy-, aryloxy-, alkylaryloxy- or arylalkyloxy-polyalkylene glycol
acrylate or methacrylate or an alkyloxy-, aryloxy-, alkylaryloxy- or arylalkyloxy-
polyalkylene glycol allyl ether.
- 20 4. The method according to Claim 1, wherein the copolymer further
comprises ethylenic monomers having at least two polymerizable double bonds.
5. The method according to Claim 1, wherein the dispersing agent is a
25 copolymer comprising:
 - a) 1% to 50% by weight of one or more anionic monomers;
 - b) 2% to 65% by weight of one or more non-ionic monomers;
 - c) 3% to 65% by weight of an alkoxy-, aryloxy-, alkylaryloxy- or
arylalkyloxy-polyalkylene glycol ethylenic monomer;

d) 0% to 90% by weight of an alkyloxy-, aryloxy-, alkylaryloxy- or arylalkyloxy-polyalkylene glycol acrylate or methacrylate, or an alkoxy-, aryloxy-, alkylaryloxy- or arylalkyloxy-polyalkylene glycol allyl ether;

e) 0% to 5% by weight of one or more cross-linking agents; and

5 the total of monomers a), b), c), d) and e) is equal to 100%.

6. The method according to Claim 1, wherein the anionic monomer is at least one monomer selected from the group consisting of acrylic acid, methacrylic acid, 2-acrylamido-2-methyl-1-propane sulphonic acid, 2-methacrylamido-2-methyl-10 1-propane sulphonic acid, 3-methacrylamido-2-hydroxy-1-propane sulphonic acid, allylsulphonic acid, methallylsulphonic acid, allyloxybenzene sulphonic acid, methallyloxybenzene sulphonic acid, 2-hydroxy-3-(2-propenyloxy)propane sulphonic acid, 2-methyl-2-propene-1-sulphonic acid, ethylene sulphonic acid, propene sulphonic acid, 2-methyl propene sulphonic acid, styrene sulphonic acid, 15 vinyl sulphonic acid, sodium methallylsulphonate, sulphoethyl or sulphopropyl acrylate or methacrylate, sulphomethylacrylamide, sulphomethylmethacrylamide, ethylene glycol methacrylate phosphate, and ethylene glycol acrylate phosphate.

7. The method according to Claim 1, wherein the non-ionic monomer is at least one monomer selected from the group consisting of acrylamide or 20 methacrylamide or derivatives thereof, C₁ to C₄₀ acrylic or methacrylic acid alkyl-esters, alkoxy-, aryloxy-, alkylaryloxy- or arylalkyloxy-acrylates or oxyalkyl, oxyaryl, oxyalkylaryl or oxyarylalkyl methacrylates (wherein the alkylene, arylene, alkylarylene or arylalkylene oxide number is between 1 and 120), vinyl acetate, 25 vinylpyrrolidone, styrene or α -methylstyrene, and ethyl acrylamide or acrylate.

8. The method according to Claim 1, wherein the alkoxy-, aryloxy-, alkylaryloxy- or arylalkyloxy-polyalkylene glycol urethane monomer is at least one monomer selected from the group consisting of reaction products of alkoxy-30 polyalkylene glycol with a polymerisable unsaturated isocyanate, and the reaction

products of methoxy-polyethylene glycol with an acrylic, methacrylic, vinyl or allyl isocyanate.

9. The method according to Claim 3, wherein the alkyloxy-, aryloxy-,
5 alkylaryloxy- or arylalkyloxy-polyalkylene glycol acrylate or methacrylate is a methoxy-polyethylene glycol acrylate or methacrylate, and the polyethylene glycol has a molecular weight greater than 300.

10. The method according to Claim 1, wherein the ethylenic monomers
10 having at least two polymerizable double bonds are selected from the group consisting of ethylene glycol dimethacrylate, divinylacetylene, divinylbenzene, trimethylolpropanetriacrylate, allyl acrylate, methylene-bis-acrylamide, methylene-bis-methacrylamide, tetrallyloxyethane, triallylcyanurates, and allyl ethers prepared from polyols.

15

11. The method according to Claim 10, wherein the polyols are selected from the group consisting of pentaerythritol, sorbitol, and sucrose.

12. The method according to Claim 1, wherein the dispersing agent is
20 fractionated subsequently to the polymerization step.

13. The method according to Claim 1, wherein the dispersing agent is completely in the form of an acid.

25 14. The method according to Claim 1, wherein the dispersing agent is partially or completely neutralized by one or more neutralization agents having a monovalent function or a polyvalent function.

15. The method according to Claim 14, wherein the neutralization agents having a monovalent function are selected from the group consisting of compounds containing alkaline cations and primary or secondary aliphatic and/or cyclic amines.

5 16. The method according to Claim 15, wherein the alkaline cations are selected from the group consisting of sodium, potassium, lithium, and ammonium.

17. The method according to Claim 15, wherein the primary or secondary aliphatic and/or cyclic amines are selected from the group consisting of
10 ethanolamines, mono- and diethylamine, and cyclohexylamine.

18. The method according to Claim 14, wherein the neutralization agents having a polyvalent function are selected from the group consisting of compounds containing alkaline-earth divalent cations, compounds containing trivalent cations,
15 and compounds containing cations with a higher valency.

19. The method according to Claim 18, wherein the alkaline-earth divalent cations are selected from the group consisting of magnesium, calcium, and zinc, and the trivalent cation is aluminum.

20

20. The method according to Claim 1, wherein the mineral filler is selected from the group consisting of natural calcium carbonate, precipitated calcium carbonate, barium carbonate, limy rocks, dolomite, talc, ground silica, silicas in general, fumed silica, fumed titanium dioxide, diatomites, iron oxides, manganese
25 oxides, titanium dioxide, lime, kaolin, metakaolin, clays, mica, plasters, fly ash, slag, calcium sulphate, zeolites, basalt, barium sulphate, aluminium trihydroxide, and mixtures thereof.

21. The method according to Claim 20, wherein the natural calcium
30 carbonate is selected from the group consisting of chalk, calcite, and marble.

22. A cement matrix or hydraulic binder, prepared by mixing a cement or hydraulic binder with an aqueous dispersion comprising a mineral filler and a dispersing agent selected from the group consisting of copolymers prepared by the radical copolymerization of at least one alkoxy-, aryloxy-, alkylaryloxy- or arylalkyloxy-polyalkylene glycol ethylenic urethane monomer with at least one anionic monomer and at least one non-ionic monomer.

23. The cement matrix or hydraulic binder according to Claim 22, wherein the urethane monomer is an alkoxy-polyethylene glycol urethane.

24. The cement matrix or hydraulic binder according to Claim 22, wherein the copolymer further comprises an alkoxy-, aryloxy-, alkylaryloxy- or arylalkyloxy-polyalkylene glycol acrylate or methacrylate or an alkyloxy-, aryloxy-, alkylaryloxy- or arylalkyloxy-polyalkylene glycol allyl ether.

25. The cement matrix or hydraulic binder according to Claim 22, wherein the copolymer further comprises ethylenic monomers having at least two polymerizable double bonds.

20

26. The cement matrix or hydraulic binder according to Claim 22, wherein the dispersing agent is a copolymer comprising:

- a) 1% to 50% by weight of one or more anionic monomers;
- b) 2% to 65% by weight of one or more non-ionic monomers;
- 25 c) 3% to 65% by weight of an alkoxy-, aryloxy-, alkylaryloxy- or arylalkyloxy-polyalkylene glycol ethylenic monomer;
- d) 0% to 90% by weight of an alkyloxy-, aryloxy-, alkylaryloxy- or arylalkyloxy-polyalkylene glycol acrylate or methacrylate, or an alkoxy-, aryloxy-, alkylaryloxy- or arylalkyloxy-polyalkylene glycol allyl ether;
- 30 e) 0% to 5% by weight of one or more cross-linking agents; and

the total of monomers a), b), c), d) and e) is equal to 100%.

27. The cement matrix or hydraulic binder according to Claim 22, wherein the anionic monomer is at least one monomer selected from the group consisting of
5 acrylic acid, methacrylic acid, 2-acrylamido-2-methyl-1-propane sulphonic acid, 2-methacrylamido-2-methyl-1-propane sulphonic acid, 3-methacrylamido-2-hydroxy-1-propane sulphonic acid, allylsulphonic acid, methallylsulphonic acid, allyloxybenzene sulphonic acid, methallyloxybenzene sulphonic acid, 2-hydroxy-3-(2-propenyloxy)propane sulphonic acid, 2-methyl-2-propene-1-sulphonic acid,
10 ethylene sulphonic acid, propene sulphonic acid, 2-methyl propene sulphonic acid, styrene sulphonic acid, vinyl sulphonic acid, sodium methallylsulphonate, sulphoethyl or sulphopropyl acrylate or methacrylate, sulphomethylacrylamide, sulphomethylmethacrylamide, ethylene glycol methacrylate phosphate, and ethylene glycol acrylate phosphate.

15

28. The cement matrix or hydraulic binder according to Claim 22, wherein the non-ionic monomer is at least one monomer selected from the group consisting of acrylamide or methacrylamide or derivatives thereof, C₁ to C₄₀ acrylic or methacrylic acid alkyl-esters, alkoxy-, aryloxy-, alkylaryloxy- or arylalkyloxy-
20 acrylates or oxyalkyl, oxyaryl, oxyalkylaryl or oxyarylalkyl methacrylates (wherein the alkylene, arylene, alkylarylene or arylalkylene oxide number is between 1 and 120), vinyl acetate, vinylpyrrolidone, styrene or α -methylstyrene, and ethyl acrylamide or acrylate.

25

29. The cement matrix or hydraulic binder according to Claim 22, wherein the alkoxy-, aryloxy-, alkylaryloxy- or arylalkyloxy-polyalkylene glycol urethane monomer is at least one monomer selected from the group consisting of reaction products of alkoxy-polyalkylene glycol with a polymerisable unsaturated isocyanate, and the reaction products of methoxy-polyethylene glycol with an acrylic,
30 methacrylic, vinyl or allyl isocyanate.

30. The cement matrix or hydraulic binder according to Claim 22, wherein the alkyloxy-, aryloxy-, alkylaryloxy- or arylalkyloxy-polyalkylene glycol acrylate or methacrylate is a methoxy-polyethylene glycol acrylate or methacrylate, and the polyethylene glycol has a molecular weight greater than 300.

31. The cement matrix or hydraulic binder according to Claim 22, wherein the ethylenic monomers having at least two polymerizable double bonds are selected from the group consisting of ethylene glycol dimethacrylate, divinylacetylene, divinylbenzene, trimethylolpropanetriacrylate, allyl acrylate, methylene-bis-acrylamide, methylene-bis-methacrylamide, tetrallyloxyethane, triallylcyanurates, and allyl ethers prepared from polyols.

32. The cement matrix or hydraulic binder according to Claim 31, wherein the polyols are selected from the group consisting of pentaerythritol, sorbitol, and sucrose.

33. The cement matrix or hydraulic binder according to Claim 22, wherein the dispersing agent is completely in the form of an acid.

34. The cement matrix or hydraulic binder according to Claim 22, wherein the dispersing agent is partially or completely neutralized by one or more neutralization agents having a monovalent function or a polyvalent function.

35. The cement matrix or hydraulic binder according to Claim 34, wherein the neutralization agents having a monovalent function are selected from the group consisting of compounds containing alkaline cations and primary or secondary aliphatic and/or cyclic amines.

36. The cement matrix or hydraulic binder according to Claim 35, wherein the alkaline cations are selected from the group consisting of sodium, potassium, lithium, and ammonium.

5 37. The cement matrix or hydraulic binder according to Claim 35, wherein the primary or secondary aliphatic and/or cyclic amines are selected from the group consisting of ethanolamines, mono- and diethylamine, and cyclohexylamine.

10 38. The cement matrix or hydraulic binder according to Claim 34, wherein the neutralization agents having a polyvalent function are selected from the group consisting of compounds containing alkaline-earth divalent cations, compounds containing trivalent cations, and compounds containing cations with a higher valency.

15 39. The cement matrix or hydraulic binder according to Claim 38, wherein the alkaline-earth divalent cations are selected from the group consisting of magnesium, calcium, and zinc, and the trivalent cation is aluminum.

20 40. The cement matrix or hydraulic binder according to Claim 22, wherein the mineral filler is selected from the group consisting of natural calcium carbonate, precipitated calcium carbonate, barium carbonate, limy rocks, dolomite, talc, ground silica, silicas in general, fumed silica, fumed titanium dioxide, diatomites, iron oxides, manganese oxides, titanium dioxide, lime, kaolin, metakaolin, clays, mica, plasters, fly ash, slag, calcium sulphate, zeolites, basalt, barium sulphate, aluminium
25 trihydroxide, and mixtures thereof.

41. The cement matrix or hydraulic binder according to Claim 40, wherein the natural calcium carbonate is selected from the group consisting of chalk, calcite, and marble.

30

42. A concrete prepared by the method of Claim 1.
43. A mortar prepared by the method of Claim 1.
- 5 44. A hydraulic concrete prepared by the method of Claim 1.
45. A grout prepared by the method of Claim 1.
- 10 46. A composition based on cement and/or calcium sulphate hemihydrate prepared by the method of Claim 1.
47. A concrete comprising the cement matrix or hydraulic binder of Claim 22.
- 15 48. A mortar comprising the cement matrix or hydraulic binder of Claim 22.
49. A hydraulic concrete comprising the cement matrix or hydraulic binder of Claim 22.
- 20 50. A grout comprising the cement matrix or hydraulic binder of Claim 22.
51. A composition based on cement and/or calcium sulphate hemihydrate comprising the cement matrix or hydraulic binder of Claim 22.
- 25 52. A building comprising the cement matrix or hydraulic binder of Claim 22.
53. A bridge comprising the cement matrix or hydraulic binder of Claim 22.
- 30

54. A road comprising the cement matrix or hydraulic binder of Claim 22.

55. An offshore construction comprising the cement matrix or hydraulic binder of Claim 22.

5

56. A petroleum cement comprising the cement matrix or hydraulic binder of Claim 22.